

## **CLAIMS**

### **I CLAIM:**

1. A pressure reduction apparatus comprising:  
a hollow vessel defining an interior and an exterior;  
a valve affixed to said vessel to allow air to enter said vessel; and  
said vessel further defining a port to allow air to exit said vessel.
2. The apparatus according to claim 1 wherein said valve prevents air from exiting said vessel through said valve.
3. The apparatus according to claim 1 wherein said valve comprises a ball valve.
4. The apparatus according to claim 1 wherein said apparatus comprises aluminum.
5. The apparatus according to claim 1 wherein said apparatus comprises aluminum alloy.
6. The apparatus according to claim 1 further comprising a pressure gauge for measuring air pressure in the interior of said vessel.
7. The apparatus according to claim 1 further comprising a temperature gauge for measuring air temperature in the interior of said vessel.

8. A vessel for reducing the temperature and pressure in air drawn from a gas turbine engine comprising:

a vessel body having an exterior and a substantially hollow interior;

a valve affixed to said vessel body providing fluid communication between the exterior and the interior of said vessel body wherein said valve permits air to enter said vessel body and prevents air from exiting said vessel body; and

said vessel body further defining an exit port providing fluid communication between the interior and the exterior of said vessel body.

9. The vessel according to claim 8 wherein said vessel body is of sufficient dimension such that air entering said vessel body is reduced in pressure and temperature in the interior of said vessel body.

10. The vessel according to claim 8 wherein the interior of said vessel body defines a sufficient volume such that air admitted to said vessel body from a gas turbine engine is sufficiently reduced in temperature and pressure at the interior of said vessel body for testing for the presence of inorganic compounds.

11. The vessel according to claim 8 wherein the interior of said vessel body defines a sufficient volume such that air admitted to said vessel body from a gas turbine engine bleed valve is reduced in temperature and pressure at the interior of said vessel body to approximately ambient conditions.

12. The vessel according to claim 8 wherein said vessel body is composed partially of aluminum.

13. The vessel according to claim 8 where said vessel body is composed partially of aluminum alloy.

14. The vessel according to claim 8 where said vessel body is composed partially of stainless steel.

15. The vessel according to claim 8 further comprising a second valve affixed to the exit port of said vessel body wherein said second valve allows air to exit said vessel body and prevents air from entering said vessel body through said exit port.

16. An apparatus for reducing the temperature and pressure in air drawn from a bleed valve of a gas turbine engine comprising:

a vessel having an exterior and a substantially hollow interior;

a valve affixed to said vessel allowing air to enter said vessel and preventing air from exiting said vessel through said valve;

said vessel further defining a port to allow air to exit said vessel;

a hollow duct with two ends, a first end of said duct drawing air from a bleed valve of a gas turbine engine and a second end of said duct attached to said valve of said vessel;

a hollow tubing with two ends, a first end of said tubing affixed to the port of said vessel, and a second end leading air to the exterior of said vessel.

17. The apparatus according to claim 16 wherein said hollow duct comprises a carbon impregnated Teflon.

18. The apparatus according to claim 16 wherein said hollow duct comprises carbon impregnated silicone.

19. The apparatus according to claim 16 further comprising a second valve affixed to the port of said vessel.

20. The apparatus according to claim 16 wherein said vessel further defines an aperture providing fluid communication between the exterior and the interior of said vessel.

21. A method for reducing air pressure and temperature in air drawn from a gas turbine engine comprising the steps of:

directing air at a starting temperature and pressure from a gas turbine engine through a hollow duct;

providing a pressure reduction vessel with an exterior and having a hollow interior;

admitting air from said hollow duct into the interior of said pressure reduction vessel; and

leading air from the interior of said vessel at a reduced temperature and pressure relative to the starting temperature and pressure, through a hose, to a point at the exterior of said pressure reduction vessel.

22. The method according to claim 21 wherein the step of directing air at a starting temperature and pressure from a gas turbine engine through a hollow duct further comprises directing air from a bleed valve of a gas turbine engine at a starting temperature and pressure.

23. The method according to claim 21 wherein said pressure reduction vessel further comprises a valve and wherein the step of admitting air from said hollow duct into the interior of said pressure reduction vessel further comprises admitting air from said hollow duct through said valve into the interior of said pressure reduction vessel.

24. The method according to claim 21 further comprising the step of measuring the pressure of air at the interior of said pressure reduction vessel.

25. The method according to claim 21 further comprising the step of measuring the temperature of air at the interior of said pressure reduction vessel.

26. The method according to claim 21 wherein said pressure reduction vessel further comprises a sample port and further comprising the step of taking a sample of air from the interior of said pressure reduction vessel through said sample port.

27. The method according to claim 21 wherein said collection bag consists of a tedlar® or similar inert material taped to the air conditioning supply vent and further comprising the step of taking a sample of air from the interior of said collection bag.